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Sent: Thursday, November 21, 2013 2:34 PM
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Subject: Update to draft Circular DEQ-12

DEQ recently released a technical document "Derivation of Site-specific Numeric Nutrient Criteria for Selected Streams in the Upper Clark Fork Basin-Addendum A". It is an addendum to our main nutrient criteria report. Site-specific criteria drawn from Addendum A for several streams in the upper Clark Fork basin were included in a recent draft of circular DEQ-12 (v6.7). However, U.S. EPA has had significant concerns with these criteria, relating to technical issues (limited reference data, concerns with certain lines of evidence DEQ used, etc.).

Because of these concerns and the rapidly-approaching deadlines for the rule-package, DEQ will not be including site-specific criteria from Addendum A in DEQ-12. As a result, nutrient criteria that apply to the streams in question revert to the Middle Rockies ecoregional values (30 µg TP/L, 300 µg TN/L), identical to what was provided in earlier DEQ-12 drafts. As part of DEQ's triennial standards review and overall commitment to developing scientifically-defensible nutrient criteria, DEQ will continue to investigate and develop site-specific nutrient criteria going forward.

To: Mike Suplee
From: EPA Region 8
Subject: Review Comments on "Addendum A: Site Specific Nutrient Criteria for the Clark Fork Basin"

Summary of MDEQ's Approach:
MDEQ considered multiple lines of evidence to establish site-specific criteria for several streams in the Upper Clark Fork Basin. The underlying concern was that elevated phosphorus concentrations were observed in some headwater sites with no documented human sources. The lines of evidence considered by MDEQ included: 1) site-specific reference data; 2) predictive modeling approach to estimating natural background concentrations for total phosphorus; and 3) ecoregional reference data.

Review Comments:

- Site-specific reference data: A single reference site was located within the Upper Clark Fork Basin. Available data was limited to a single TP observation.
    - The limited data undermine the use of this line of information. Ideally, sufficient data would be collected to meet MDEQ's minimum dataset requirements or at least include several more samples.
    - In addition, the TP value of 12 µg/L suggests that natural background TP concentrations in the Upper Clark Fork Basin may be much lower than the proposed criterion of 40 µg/L.
    - In addition, the single TP value of 12 µg/L seems comparable to the median TP concentration of the larger Middle Rockies dataset, not the subset of the data influenced by volcanic geology.
    - *Improving the Rationale*: Typically, site-specific criteria are derived using site-specific data. Additional analyses of the headwater sites where elevated TP concentrations were observed could help document the elevated TP concentrations. Even if they do not qualify as reference sites because of the area's mining history, the data could be useful and perhaps. If you have concerns about elevated metals concentrations confounding the phosphorus concentrations the sites could be screened and categorized based on metals concentrations since some of the streams are not impaired for metals. In addition, collecting more samples at the single reference site would provide additional information on the variability of the nutrient concentration and a better sense of localized natural background concentrations.
- Modeling TP concentrations:
    - MDEQ tested the applicability of a modeling approach used to predict background TP concentrations.
    - MDEQ's rationale states: "For the purposes of site-specific nutrient target development in the Upper Clark Fork River, the findings of the Olsen and Hawkins model (2013) are a valuable independent data source although the model runs did not yield the anticipated differences between basis with known

volcanic geologies and those with none of minimal mapped volcanic formations".
    - Therefore, the modeling line of evidence did not support an increase in TP concentrations associated with volcanic geology.
    - While an interesting test of the modeling approach, the line of information did not strengthen MDEQ's justification for site-specific criteria.
- Middle Rockies Reference Dataset: MDEQ analyzed the Middle Rockies reference sites influenced by volcanic geology.
    - This analysis reduced the dataset from 61 reference sites to 9 sites.
    - There are a few concerns if this information serves as the primary line of evidence driving site-specific criteria for the Upper Clark Fork River basin:
        - The reference site within the Upper Clark Fork basin shows TP concentrations closer to the broader Middle Rocky ecoregional values, not the subset influenced by volcanic geology.
        - There is no site-specific data being used to establish the site-specific criteria.
        - MDEQ considered reference values and dose-response values when establishing the Middle Rockies nutrient criteria. In selecting a criterion, MDEQ states that "studies that have the most specificity to the Middle Rockies suggest criteria ranging from 20-40 µg/L TP". Since MDEQ's selected the original Middle Rockies TP criterion based on both reference information and relevant dose-response studies, there is a certain amount of inherent uncertainty in the final criterion. Is it reasonable to assume that there is more certainty in the 40 µg/L value than in the science behind the original criterion?
        - In Addendum A, MDEQ shows that the 9 reference sites influenced by volcanic geology are statistically different than the Middle Rockies reference sites as a whole. If indeed that is the case, this would suggest that the Middle Rockies criteria should be redone to exclude the reference sites influenced by volcanic geology, and a separate criterion established for the volcanically influence Middle Rockies streams.

- TN Criterion Derivation and Selection of the 81st Percentile for the TP criterion: We recognize that additional detail/ discussion on the two topics may be provided in other documents (e.g., nutrient criteria document Update 1; Implementation Guidance). However, for readers concentrating on Addendum A, additional background information would be useful. For example, the description of the basis for the TN criterion says the Middle Rockies criterion should be "somewhat lowered", which makes the recommended concentration seem arbitrary. Perhaps the N:P ratio was used to select a criterion, but the ratio reads as an afterthought. We recommend including more background in this document so the reader has a more complete understanding of the basis for MDEQ's decisions.

Summary Comment: While MDEQ attempted to use multiple lines of information, the final rationale hinges on Middle Rockies reference sites with volcanic geology.

Recommendations:
We recommend the following if MDEQ wants to pursue adoption of a site-specific criterion for the Upper Clark Fork Basin:

- Additional site-specific data would be helpful to present. This could include: additional data collected on Braggs Creek; available data from headwaters streams showing elevated TP concentrations.
- Information on the response indicators within the watershed and associated nutrient concentrations would provide some evaluation that aquatic life uses are supported at the higher concentrations.
- Another approach would be for MDEQ to collect additional data and establish criteria for the entire subclass of waters in the Middle Rockies influenced by volcanic geology.
- The rationale presented in Addendum A suggests that since the Middle Rockies ecoregional criteria included waters influenced by volcanic geology, those ecoregional criteria may need to be revisited to exclude those reference sites – thus, lowering the proposed Middle Rockies ecoregion. The rationale should address this issue and may result in potential revisions to Middle Rockies criteria in DEQ Circular-12.